



بسم الله الرحمن الرحيم

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تم رفع هذه الرسالة بواسطة / مني مغربي أحمد

بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون أدنى

مسئولية عن محتوى هذه الرسالة.

ملاحظات: لا يوجد





**Assessment of low-cost surgical metallic clip
placement for tumour localization in BIRDAS
VI breast cancer patients undergoing
neoadjuvant chemotherapy"**

Thesis

Submitted for Partial Fulfillment of
M.D. in Radiology

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2022



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا عَلَّمْتَنَا
إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ

صدق الله العظيم
(سورة البقرة - الآية ٣٢)



*First and foremost, I feel always indebted to **Allah** the Most Beneficent and Merciful.*

*I wish to express my deepest thanks, gratitude and appreciation to **Dr.Randa Hussein Abdallah**, Professor of Radiology department, Faculty of Medicine, Ain Shams University, for her careful supervision, valuable instructions and generous assistance.*

*Special thanks are due to **Dr.Amal Ibrahim Ahmed**, Assistant Professor of Radiology department, Faculty of Medicine, Ain Shams University, for her sincere efforts, fruitful encouragement.*

*I am deeply thankful to **Dr.Suzan Farouk Ibrahim**, Lecturer of Radiology, Faculty of Medicine, Ain Shams University, for her great help, outstanding support, active participation and guidance.*

I would like to express my hearty thanks to all my family for their support till this work was completed.

Norhan Osama shawky

Abstract

Background: Neoadjuvant chemotherapy has become a challenging connotation for both surgeons and radiologists due to the high clinical response up to dramatic pathological complete response (pCR) that may hinder proper localization of any residual tumoral tissue. So the radiopaque markers implantation at the tumor bed became a reliable and recommended method for tumor localization before surgical intervention or NAC. Many types of commercial clips and markers are available; however they are relatively of high cost and represent a considerable burden on the governments and the health institute that made the researchers study cheaper alternatives as standard titanium based cholecystectomy surgical clips for tumor localization. Results: The study was conducted on 45 patients where 57 clips were inserted corresponding to number of lesions found in the total number of the patients. The response to Neoadjuvant chemotherapy was recorded and showed that 6 patients (about 13.3%) had complete radiological response after NAC, while 27 patients (60%) had regressive course after the treatment. The low cost surgical clips were evaluated by using sonomammography and magnetic resonance imaging, and complications that occurred were recorded. Our study showed that in only 2 patients (3.5%) there was difficulty in clip visualization by Ultrasound during post-treatment follow up. In 45 patients, all the inserted clips (100%) were well visualized as small signal void on MRI at both T1WIs and T2WIs sequences, and the primary malignancy was easily visualized on both MRI and sonomammography not interfering with the image interpretation and judgment. As regards the reported complications, our results revealed that in only 2 patients (3.5%) there was evidence of positive clip migration, while only 2 patients (3.5%) developed hematoma during the procedure as shown by ultrasound, Also 4 patients (7%) complained of pain only shortly after clip insertion. No other significant complications like infection or heat sensation developed either during the procedure or during MRI. The total price of the surgical clips was calculated with average cost of the needle about 10 US\$ equivalent to 170 LE Egyptian pounds and the clip about 1.3 US\$ or 20 Egyptian pounds, which is considered of lower cost when compared to the commercial breast markers of different companies with an estimated price range for clip=75–200 US\$ (average 90 US\$). So insertion of surgical clips saved about 1135 Egyptian pounds equivalent to 73–75 US\$ per clip placement. Conclusion: We concluded from our study that the use of breast markers are mandatory before NAC where Surgical clips can safely substitute the commercial tissue markers as tumor localizers as they are effective, safe, well tolerated, easily visualized on imaging and do not interfere with assessment of the treatment response, with no evidence of complications and are of low cost compared with the commercial breast clips. Keywords: Breast cancer, Neoadjuvant chemotherapy, surgical clips.

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